

Focusing On IBM Host-Based Enterprise-Wide Computing

ENTERPRISE SYSTEMS

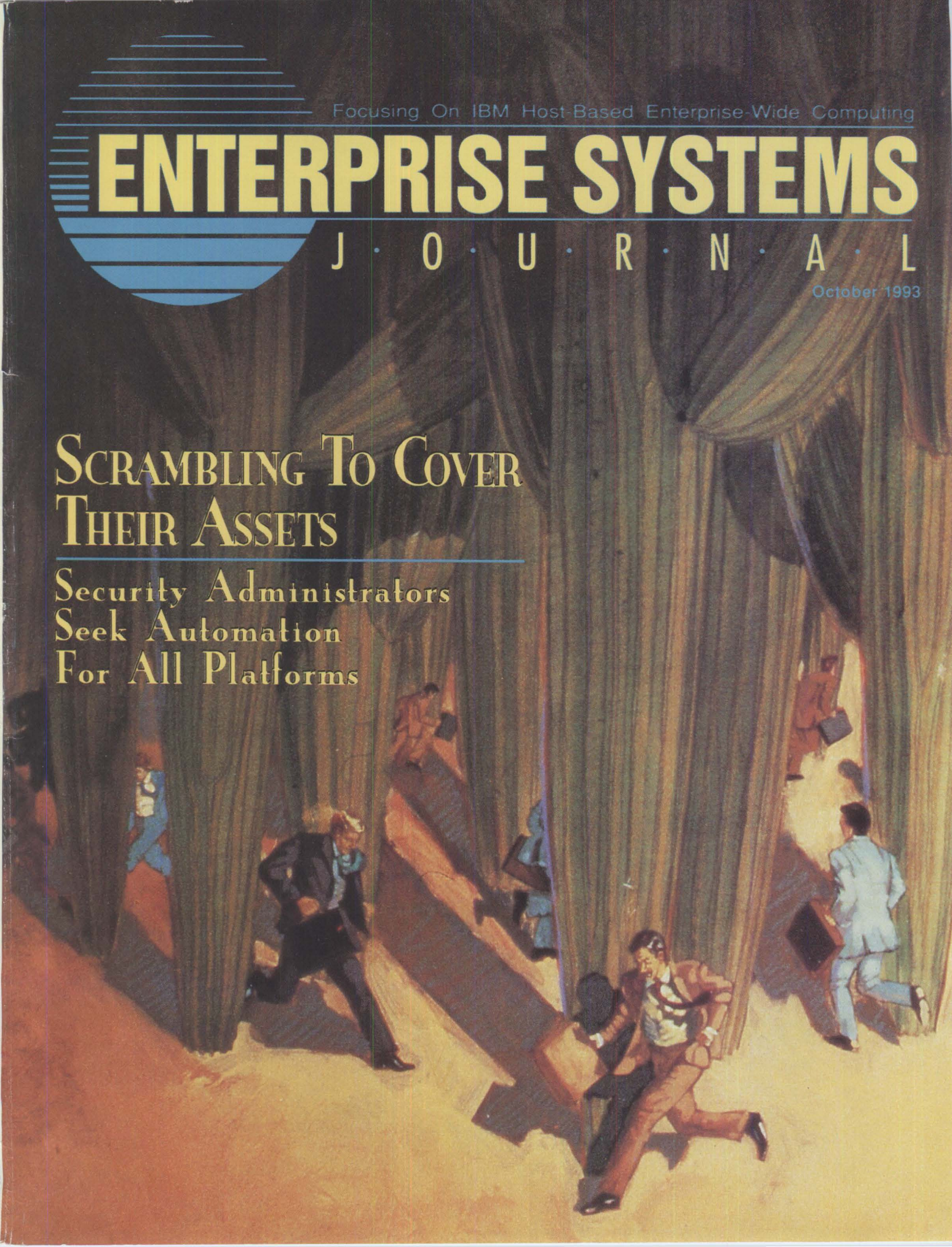
J · O · U · R · N · A · L

October 1993

SCRAMBLING TO COVER THEIR ASSETS

Security Administrators
Seek Automation
For All Platforms

ENTERPRISE SYSTEMS JOURNAL



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ESJ SUPPLEMENT

VM/ESA® Today's Proven Client/Server Solution

COVER

With the advent of client/server technology, many security administrators are scrambling to secure platforms other than the mainframe. To explore today's security challenges, read Arnold Farber and Rosemary LaChance's article on page 94. Cover illustration by Guy Porfirio.



Bob Thomas

New IBM Ad Campaign Uses The "M" Word!

Look at the ad below — see anything unusual? After months of being beaten up in the press about the “death of the mainframe,” IBM is defiantly roaring back in support of its mainframe business and mainframe customers — and not a moment too soon. I feel certain that IBM sales reps and CIOs in organizations using IBM mainframes are thrusting their fists up in the air with cries of, “It’s about time!” Rather than sitting back and absorbing the body punches being thrown by the business press proclaiming downsizing and client/server computing as panaceas for enterprise-wide computing, IBM will be even more aggressively presenting the success stories of how its customers rely on mainframes

to “access, manage, distribute and protect” critical information.

In the past, IBM rarely advertised its mainframe products because it was considered to be “preaching to the choir.” However, the unprecedented events of the past year have mandated a change in IBM’s marketing tactics with a stronger emphasis on the customer. And what do IBM’s largest customers use? They use mainframes.

Bob Thomas



What makes Wall Street savvy enough to always be in touch with the latest dynamics of companies, industries, currencies, commodities and all those other strange things most of us don't understand?



PCs, workstations and midrange computers, linked to

Mainframes, what else?

To describe a language as an information-intensive business is a bit of an understatement. Like certain other industries, the information is the business.

That's why they rely so heavily on mainframes to serve the rest of their computer network.

By being linked to a mainframe, every desktop PC and workstation has access to vast amounts of information, everything from customer portfolios to emerging company research.

And since for businesses like this, time literally is money, companies have come to depend on mainframes to give them access to that information

instantaneously, 24 hours a day, 7 days a week.

The fact is, no matter what your business, if it depends on information, nothing can "serve" the rest of your computer network "faster" to nearly the degree a mainframe can. And the new "openness" of mainframes allows them to serve just about any kind of hardware and software.

Every day, information plays an increasingly vital role in the success of more and more businesses. And so do mainframes. Because nothing is better equipped to access, manage, distribute and protect your information than a mainframe. Absolutely nothing.



The IBM System/390

Congratulations to IBM's Jim Hahn and his talented associates in Enterprise Systems (now called Large Scale Computing Division) for coming up with a brilliant campaign.

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IBM's Personal/370

By Jon E. Pearkins

One of the first attempts at downsizing involved moving stand-alone applications from the mainframe to the workstation. The next strategy was client/server, a formalization of cooperative processing, where the application is split between the workstation and the mainframe.

To save the cost of recoding large, complex or poorly documented *legacy* systems, the third downsizing method saw mainframe compilers, file access methods and OLTPs implemented directly on the workstation. Because the *look and feel* are the same as the mainframe, end-user retraining is not required.

The fourth alternative, which IBM's Personal/370 (P/370) supports, allows mainframe software to run directly on the workstation. Instead of running applications through work-alike mainframe systems software that has been written for the 80x86 architecture, the original mainframe systems software, all the way down to the operating system, runs *as is* on the workstation. Even the most obscure systems software feature is there.

IBM's P/370 card gives a PS/2 a hardware-based System/370 architecture. Because S/370 is just another task to OS/2, 80x86-based software can run simultaneously on the same workstation.

History

When IBM introduced the PC in 1981, instantly making the microcomputer an accepted data processing tool in corporate America, S/370 programmers began looking for the day when they would have their own S/370s on their desks. There was even a newsletter dedicated to just that topic in the early 1980s.

IBM soon offered such products — first the XT/370, then the AT/370. They consisted of several boards added to a standard PC. Programs were limited to 4MB or 8MB of virtual memory, depending on the model, and ran under a special version of VM called VM/PC. These and other restrictions limited their popularity.

Introduced in the late 1980s, the 7437 was much more mainframe-compatible, running standard VM/SP. The only virtual memory limitation was that of the S/370 architecture: 16MB. It came with 16MB of real memory and required a PS/2 tower-sized chassis just for the S/370 portion and a real PS/2 for I/O support. It was, however, underpublicized and the minimum order was 25.

The 9371 was introduced in 1990 when marketing was more aggressive. It was given a big boost by State Farm Insurance's purchase of thousands of 9371s for their agents. The original

Models 10, 12 and 14 were replaced with Models 110, 112 and 114, announced as part of the S/390 ES/9000 family in September 1990 under the name Micro Channel 370. Although only one-quarter the size of the smallest 9370, a 9371 was significantly larger than a PS/2, combining the S/370 and PS/2 I/O support in one chassis. With the exception of Models 14 and 114, the 9371 ran only S/370 programs; the high-end models were the only ones allowing use of OS/2 or PC-DOS. Using a PS/2 chassis, standard PC hard disks provided up to 4GB of DASD.

Description

The P/370 is one standard-sized card you can add to any micro channel-based PS/2. The CPU is a single module containing 110K gates and 391 pins. Its speed approaches 4 MIPS, about that of the fastest uniprocessor 4381. The P/370 runs any S/370 operating system, systems software and application software that supports 24-bit (non-XA) addressing and Fixed Block Architecture (FBA) DASD. The latter restriction can be overcome by using a third-party VM software package to provide the FBA to Count Key Data (CKD) translation.

The I/O and channel functions require emulation of S/370 devices on PS/2 devices. OS/2 applications known as device managers provide this, which explains why the PS/2 requires OS/2 2.x and Extended Services 1.x. To OS/2, running the S/370 I/O instructions and device emulation is just another task. That means the OS/2 workstation is still available for normal work, including acting as a host workstation to a *real* mainframe. It also means that performance during heavy S/370 I/O depends on the capabilities of the PS/2; these tests used a 16MB Model 95 XP 486.

Although device emulation is quite flexible, normal PS/2 hard drives usually emulate DASD; each DASD volume is an OS/2 file. A high-end PS/2 has room for four 2GB hard disks, providing 8GB of capacity. The standard IBM Proprinter may look like a system line printer or user's VTAM printer. The standard PC's SDLC card becomes an Integrated Communications Adapter (ICA) like that found on the 9370.

Although it looks like a disk drive, the new PS/2 3.5-inch rewritable optical drive can read, write and rewrite removable 128MB optical disks. Upon insertion, the first access is slow, but subsequent I/O approaches the speed of a hard disk. The P/370 typically views this as a tape drive that provides an

**The P/370 card
deserves serious
consideration for
downsizing, moving
existing applications
to distributed
locations and even
stand-alone application
development.**

A User's View Of Leveraging The Mainframe Investment

Rather than using the word downsizing, which usually implies changing software platforms, *rightsizing* is probably a better term to describe the P/370. You can leverage your existing education and training, which is an enormous, often underestimated cost when going to a different platform. Organizations have a commitment to their SNA backbone and architecture, but they need to have other networking capabilities. Putting the P/370 card into a PS/2 gives them those kinds of open systems now, without rewiring.

MTRAX is an organization that practices what it preaches. As well as selling the P/370 with the shop floor control (PFORMS) manufacturing software it specializes in, MTRAX also uses it. A single card on a PS/2 runs VM to provide a development and test machine, a training machine and a production machine for the developers, each with a workstation connected via token-ring. The team develops new applications and maintains them on a continuous basis using CSP. Scheduling CSP/AD code generations is its only accommodation to performance considerations. The final product is shipped to customers on 3.5-inch diskettes, rather than bulky mainframe tapes.

A typical manufacturing firm operates one centralized processor serving half-a-dozen plants via dedicated teleprocessing lines with 3174s in each plant. With the P/370, each plant has its own independent stand-alone PFORMS system. By channel-attaching the 3174 to the P/370, terminals suddenly operate at channel speeds, instead of some fraction of the leased line's speed.

The next step distributes the application function to multiple P/370s: one each in scheduling, production, labor, quality

reporting and inventory, each capable of supporting multiple token-ring-attached workstations. IBM's Distributed Relational Database Architecture (DRDA), which SQL/DS supports, seamlessly integrates the database across all of these machines, making it look like one big database to the user. Even though VM and SQL/DS are running under the covers, from the user perspective this VM file server appears as an icon on the PS/2 workstation. Click on the icon for access to any of the data across the distributed database.

Compare a PS/2 equipped with the P/370 card to the traditional PC workstation. PCs are single-tasking workstations or, at best, multitasking, but still serve only one person. Managing data on a PC typically means moving files around. The P/370 supports multiple token-ring-attached workstations with the mature kind of multitasking and data sharing found on the mainframe with systems like CICS and VTAM. All of the data integrity issues have been addressed years ago. Adding DRDA integrates multiple P/370s into the picture just as easily. On a realtime basis, right from the workstation, the user has access to the data required to make those critical management decisions. Even the engineering user plugs right into the network and has access to both UNIX-based engineering and mainframe-based production data all from the same workstation. It is hard not to become excited about something this powerful.

Ron Hagwood, MTRAX
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excellent form of backup. Because of its speed, it could also be used as DASD in case of a hard-disk failure.

Backup uses either the utilities of the mainframe operating systems or an OS/2-based package. In VM, perhaps DDR could be used. On the PS/2 side, this can be something as simple as COPY or XCOPY, or involve transferring the files to a LAN server where the LAN operating system or host's enterprise-wide data management software handles backup.

The optical drive enables software and data distribution, such as maintenance and new versions of software and regular refreshes of application databases. But being host-attached, typically through a LAN, a fully automated approach to distribution would use peer-to-peer VTAM. NetView's Distribution Manager now allows the automatic distribution of maintenance for OS/2 on attached workstations. This capability allows the creation or update of any OS/2 file on any workstation. Files distributed in this way could then be automatically transferred from the OS/2 session to the S/370 operating system, completing the update cycle.

The optical disks allow initial distribution of a mainframe operating system to a number of P/370-equipped workstations. Installation is then just a matter of restoring a backed-up copy of the system volume(s).

CIRCLE #158 on Reader Service Card ▲

Installation

A PS/2 comes with OS/2 preinstalled and the P/370 card snaps in without any additional cabling. Next, install OS/2 Extended Services, then the VM starter system supplied for the P/370.

The only other software that must be installed is the P/370 OS/2 program and the licensed internal code for the P/370 card itself. The only CONFIG.SYS changes are a DEVICE statement and the addition of the P/370 directory to the search path. Hardware configuration — mapping CUU devices to workstation devices and OS/2 files — is done using the typical PC fill-in-the-blanks, menu-driven approach.

The test machine used for this product evaluation also ran VSE/SP 4. VSE ran unchanged, copied directly from a mainframe customer site, along with CICS and VTAM.

Hands-On

The VM/CMS version of a large multiplatform third-party application development system was selected for testing. Its complex installation process, designed in the days of Virtual Machine Facility/370

(VMF/370), requires its own service machine and DCSS, as well as the use of CMSDOS and CMSVSAM. It consists of 1400 CSECTs, including 500 modules that are loaded when needed at runtime. VSAM files store the tables defining user applications and the product's own user interface.

Because the product comes on a nine-track tape, a special card was installed on the test machine, requiring another DEVICE statement in CONFIG.SYS. The PS/2 Micro Channel to Mainframe Connection Card and accompanying cable allow the attachment of most channel-attached S/370 devices; e.g., no mainframe DASD.

A non-IBM 3420-equivalent tape drive and controller worked flawlessly when attached. Before using it to install the software package, the drive IPLed an old stand-alone DSF tape normally used on an MVS host. DSF initialized the required VSAM space.

This test used an early version of the VM starter system based on VM/SP 6.18. Unlike VM/ESA, defining the DCSS in VM/SP requires rebuilding the nucleus,

and, to save disk space, the necessary tools were not supplied with the early starter set. With Transparent File Access (TFA), the HLINK command could link to a VM host's minidisk containing these tools. This host minidisk then looks like it is on the workstation's VM system.

Information from OS/2 is transferred to the P/370 using the OS/2 SEND command, which uses IND\$FILE. From the P/370, VM/CMS has a PCOPY command for import and export to OS/2.

Since general availability, the P/370 comes with a complete VM/ESA system running in 370 mode.

Overall Impressions

The windowed approach provides easy access to five terminal sessions, system console(s), configuration and normal OS/2 sessions. A miniwindow even displays "processor busy." You really feel like you are in control.

This is not a single-user machine. Beyond the multiple terminal sessions on the attached PS/2, LAN-attached OS/2 workstations access the P/370 as if it were a larger mainframe host.

The DASD emulation is not costly. A 7968 4KB block VM minidisk occupies a 36,872,192-byte OS/2 file, which works out to 88.5 percent utilization. For 4KB blocks, a 3380 only gives 94.9 percent utilization.

The P/370 eliminates the application conversions and learning curve associated with traditional downsizing approaches. It deserves serious consideration for downsizing, moving existing applications to distributed locations and even stand-alone application development. For about the cost of a high-end PS/2, a Micro Channel card gives you complete S/370 application transportability. For more information, contact IBM at (800) 426-7636 in the United States or (914) 435-8477 elsewhere. ☺

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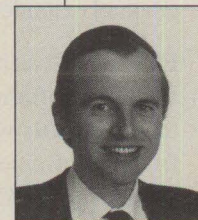
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